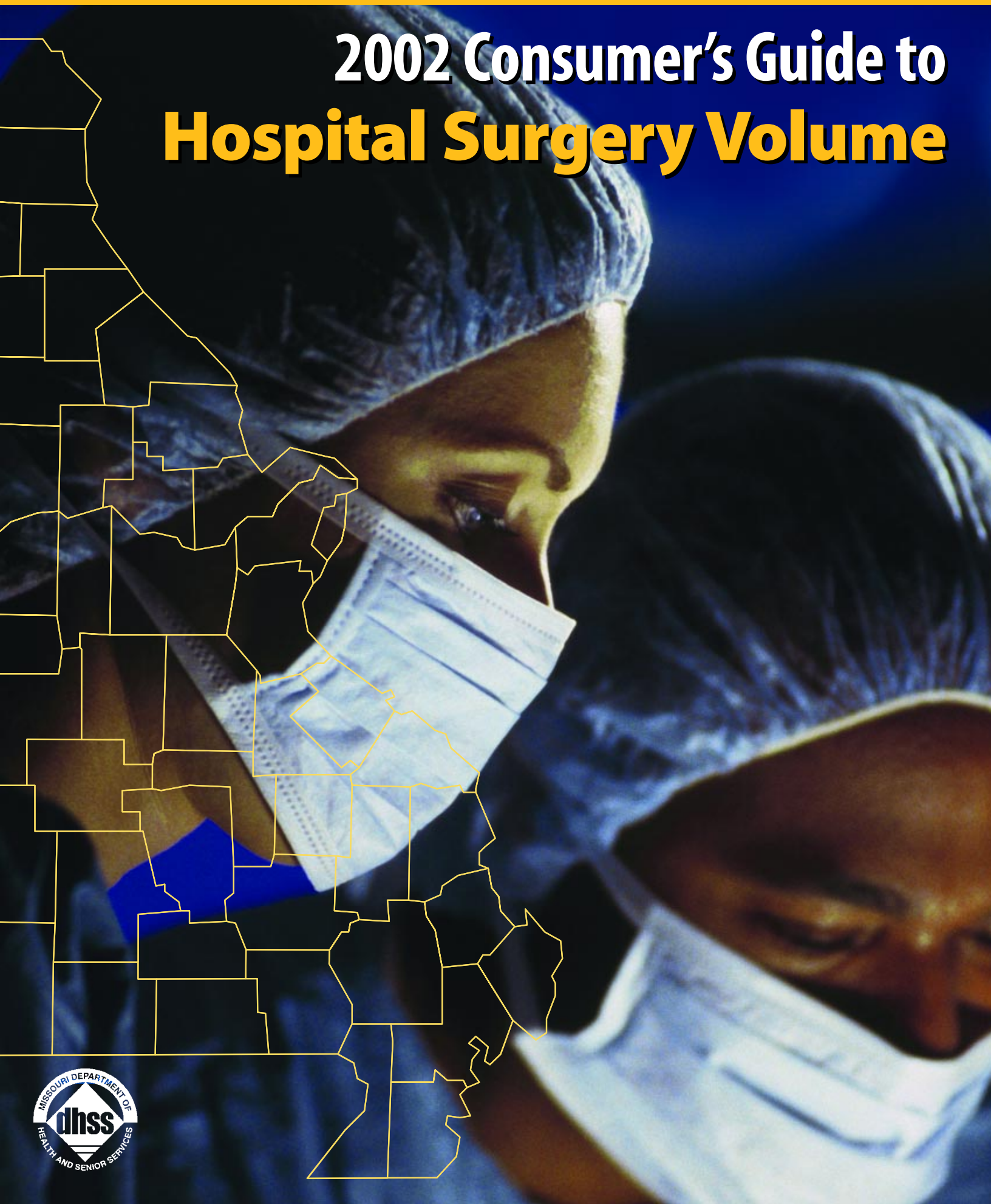


**Show Me...**

# **2002 Consumer's Guide to Hospital Surgery Volume**



# Welcome...

As part of its mission to protect and promote the health of Missourians, the Department of Health and Senior Services (DHSS) is pleased to issue this consumer guide. Inside are reports on the volume of various surgical procedures performed in Missouri hospitals. This information can assist health care consumers and purchasers in making informed choices regarding these surgical procedures.

We believe that consumers have a right to know as much as possible about the services from health care providers and about the quality of these services. Empowered with this information we can all contribute to developing and providing the highest quality of health care for the citizens of Missouri.

## Table of Contents

Introduction .....	1
What Makes a Difference—Surgeon, Hospital or Both? .....	2
What Do the Procedure Pages Tell Me? .....	3
Carotid Endarterectomy .....	4
Coronary Artery Bypass Graft .....	6
Heart Transplant .....	8
Pediatric Cardiac Surgery .....	9
Percutaneous Transluminal Coronary Angioplasty .....	10
Abdominal Aortic Aneurysm Repair .....	12
Lower Extremity Arterial By-Pass .....	14
Cerebral Aneurysm Repair .....	16
Esophageal Cancer Surgery .....	17
Pancreatic Cancer Surgery .....	18
Table of Hospitals .....	19
Bibliography .....	20
Acknowledgements .....	22



The Missouri Department of Health and Senior Services has attempted to publish accurate information based upon common definitions. The data reported in this brochure are based on hospital discharge data reported from 1998 to 2000. Hospitals were given an opportunity to review and correct the data presented. Other corrections or suggestions should be forwarded to the Center for Health Information Management and Evaluation, Missouri Department of Health and Senior Services, PO Box 570, Jefferson City, MO 65102. Our telephone number is (573) 526-2812.

The Missouri Department of Health and Senior Services is an equal opportunity/affirmative action employer. Services are provided on a nondiscriminatory basis. This information is available in alternate formats to citizens with disabilities.

[Publication Number 21.18] Printed on recycled paper Designed by Janet Cuthbertson

# Show Me... 2002 Consumer's Guide to Hospital Surgery Volume

Over the last several decades a steady stream of research has found a relationship between the quality of care for selected surgical procedures and the number, or volume, of procedures performed. Recently, the prestigious Institute of Medicine (IOM) convened a group to review the current understanding of this relationship. The report states the following:

*"An association between higher volumes and better outcomes has been well-documented for certain types of health care. Some health care purchasers are using these findings to refer patients to higher-volume settings for selected procedures. The evidence prompted the National Cancer Center Policy Board to recommend that cancer patients in need of highly complex surgical procedures go to higher-volume facilities for care (IOM, 1999). Despite considerable evidence of a volume-outcome relationship, many questions remain about the nature of the relationship, the processes of care that might explain it, and its implication for health policy." [IOM, 2000]*

The link between procedure volume and outcome is not always found. In fact, at times one study may contradict the findings of another study. Why does this happen? Sometimes these differences are due to the quality of the research conducted. Other times, the differences may relate to different methods of study, or even the population studied. Regardless, there is sufficient evidence to say that for some procedures a relationship exists between the volume of procedures performed and the quality of the outcomes for those procedures.

Does "practice make perfect?" Or does "perfect make practice?"

While studies have been conducted on the relationship between procedure volume and quality outcomes, yet another set of questions has been raised: Does "practice make perfect"? or does "perfect make practice"? In other words, when a relationship is found between procedure volume and the quality of outcomes for that procedure, what does it really mean? Is it true that the more you do anything, whether it is music or medicine, the better you perform? Or rather, is it true that "success breeds success"? That is, when an organization is known for a good product or good service it gets more business.

Applied in this instance, hospitals that perform certain surgeries well will have more patients seeking those surgeries at those hospitals. Both points-of-view make sense, and to some extent, the exact nature of the relationship between the number of procedures performed and quality is not known. But either way, for the procedures chosen for this guide there is a relationship and that relationship should inform your decisions about health care services and surgeries.

---

*...there is sufficient evidence to say  
that for some procedures  
a relationship exists between  
the volume of procedures performed  
and the quality of the outcomes  
for those procedures.*

---

# What Makes a Difference - Surgeon, Hospital or Both?

There is an additional issue that must be considered and several questions that should be taken into account in using this report. What is more important, the volume of procedures performed by the surgeon, the volume of procedures performed in the hospital, or both? The skill and experience of the physician are, of course, highly important to the quality of care and “good outcomes.” However while the individual surgeon performs surgery, a surgical team (or at least a surgical assistant) assists with the procedure. In addition there are a wide array of hospital services and personnel that impact on the surgical outcome that may not be evident or considered.

For example, while a patient may undergo a procedure performed in the most skillful way by a surgeon and the surgical team, post-operative care of a surgical incision may result in a preventable infection if infection control techniques are not followed. Such practices may result in less-than-optimum outcomes, though the quality of the surgery was excellent. Those aspects of care provided under the supervision of the hospital, as well as the performance of the surgeon, are important to quality care.

While data on procedure volume by physician are not available for analysis and publication, it is possible to examine patient data that are routinely reported by hospitals to the Missouri Department of Health and Senior Services, to determine the facility-level volume for procedures. This report focuses on the volume of selected procedures, as reported by general, acute care hospitals across the state.

**Keep in mind – our medical knowledge is always expanding!**

As part of its public health mission, the Department of Health and Senior Services feels that evidence-based information disclosures in consumer guides are in the public interest. In selecting the procedures reviewed for this report, we took into account a number of research studies, the strength of the evidence, the source of the study, and input from national and state experts. In addition, a statewide advisory committee reviewed the development of this report. Over time, new information may provide further insight on the volume to outcome relationship for these procedures. The information contained in this report is the best available at this time.

Comparing hospitals to make a decision on where you should have a procedure performed can be a difficult and complex decision. An informed health care consumer gathers all the relevant information available to make these important decisions. Additional information, such as the hospital's proximity to one's home or the home of relatives and friends, travel time, insurance coverage, cost, alternative new technologies, the hospital and surgeon's reputation in the community are examples of the many factors that consumers may also want to take into account. This report, when used in conjunction with these other considerations, and discussed with a trusted personal physician, can help you make an informed health care decision for yourself or a family member.

---

*Those aspects of care provided under the supervision of the hospital, as well as the performance of the surgeon, are important to quality care.*

---



# What Do the Procedure Pages Tell Me?

**Hospitals** are identified in a procedure table by major population centers within each region of the state. Hospitals not located in a designated population center are listed alphabetically under the heading Rest of Region.

**Average Annual Volume** indicates the average number of procedures performed per year at these hospitals during the calendar years 1998 through 2000. It was calculated by adding the number of procedures performed during the three-year period and dividing by three. *Hospitals that performed less, on average, than one procedure per year are not displayed.*

**Volume Thresholds** for hospitals and surgeons are reported in blue text after a description of the procedure. Compare a hospital's average annual procedure volume, from the table, to these recommended hospital thresholds. Keep in mind that volume below the recommended level does not in itself indicate poor quality of care. The Department did not evaluate each hospital's surgery outcomes. Here, we only report evidence-based volume thresholds from reputable research studies. References for these thresholds can be found in the bibliography.

**Procedure-Specific Questions** suggest surgery related information that is useful for you to know. Listen carefully to the responses of both your primary doctor and the surgeon. Write down their answers or have them written for you.

## How was this report developed?

The Missouri Department of Health and Senior Services, in consultation with an advisory committee, reviewed research studies that address the relationship between volume of procedure and quality of care for each of the procedures presented in this guide. Most of these studies suggest that the more a hospital or physician performs each of these particular procedures, the better the patient outcome. Patient outcomes were indicated as mortality (death) rates, complications after surgery, and/or re-hospitalization (readmission) rates after discharge.

Data used in this guide come from the most recent annual hospital discharge records reported to the Department as required by Administrative Rule 19-10-33.010. Information on surgery volume is primarily useful to the patient who has time to discuss pending procedures with their physician and other health care professionals.

## Questions to Discuss with Your Doctor and Surgeon

Remember that you need to develop a partnership with your physician to assist you in making more informed decisions about your medical care. A key to developing that partnership is to discuss your care and ask questions. When your primary care doctor refers you to a surgeon there are also a number of questions that you need to consider asking. These include the following questions.

- ◆ What are the risks involved with this procedure?
- ◆ Why do I need to have this procedure?
- ◆ How long will I have to stay in the hospital after the surgery?
- ◆ How long will I take to recover?
- ◆ How soon will I be able to return to work?
- ◆ Will I have to follow a special diet?
- ◆ Will I have to change my physical activity after my surgery?
- ◆ Will I need to take medication after my surgery?
- ◆ How many of these surgeries have you done?
- ◆ Who will actually perform my surgery?
- ◆ Who will be assisting the doctor in the operating room?
- ◆ How will I be prepared for my surgery?
- ◆ How should I prepare for the surgery?
- ◆ How many of these surgeries have been performed in this hospital?

# Carotid Endarterectomy

Carotid endarterectomy is an operation in which the surgeon removes an obstruction in the carotid (neck) artery caused by hardening of the arteries (atherosclerosis). This operation is performed to prevent stroke. A stroke is a cardiovascular disease that affects the blood vessels supplying blood to the brain. It occurs when a blood vessel bringing oxygen and nutrients to the brain bursts or is clogged by a blood clot or some other particle. Because of this rupture or blockage, part of the brain doesn't get the blood flow it needs which kills the nerve cells in the affected area of the brain. Once these cells die, they cannot be replaced and the part of the brain controlled by these cells cannot function.

Carotid artery problems become more common as people age. People at risk for carotid artery problems are those over age 65 (especially people who smoke) and those who already have poor circulation in the legs or their heart.

Carotid endarterectomy by an experienced surgeon is a very effective way to reduce the risk of stroke. During the procedure, the obstruction in the artery is removed.

Research suggests that hospitals that perform 100 or more of these operations per year will have better patient outcomes than hospitals that perform less than 100 of these operations per year. The optimum (or best) threshold for surgeons has been identified at 6 carotid endarterectomies per year. However, some articles have suggested that for both physicians and hospitals, a low volume of carotid endarterectomies is a range of 1 to 12 per year, a mid volume is a range of 13 to 49 per year, and a high volume is over 50 per year.

[See page 20 for references, numbers 7, 8, 14 and 24.]

Region	Average
Subregion	Annual
Hospital	Volume
<b>Central / Northeastern Region</b>	
<b>Columbia</b>	
Boone Hospital Center	171
Columbia Regional Hospital	13
University Hospitals and Clinics	90
<b>Jefferson City</b>	
Capital Region Medical Center	22
St. Mary's Health Center	62
<b>Rest of Area</b>	
Audrain Medical Center	22
Bothwell Regional Health Center	44
Fitzgibbon Hospital	4
Hannibal Regional Hospital	49
Lake Regional Health System	22
Northeast Regional Medical Center	64
<b>Kansas City / Western Region</b>	
<b>Clay / Platte Counties</b>	
Liberty Hospital	77
North Kansas City Hospital	139
Saint Luke's Northland Hospital	9
<b>Eastern Jackson County</b>	
Independence Regional Health Center	62
Lees Summit Hospital	7
Medical Center of Independence	25
St. Mary's Hospital of Blue Springs	4
<b>Kansas City (Jackson County)</b>	
Baptist Medical Center	55
Research Medical Center	146
Saint Joseph Health Center	69
Saint Luke's Hospital	212
Truman Medical Center-Hospital Hill	12
<b>Rest of Area</b>	
Cameron Community Hospital	6
Heartland Hospital East & West	94

Region	Average
Subregion	Annual
Hospital	Volume
<b>Southeastern Region</b>	
<b>Cape Girardeau</b>	
Southeast Missouri Hospital	90
Saint Francis Medical Center	120
<b>Rest of Area</b>	
Missouri Delta Medical Center	13
<b>Southwestern Region</b>	
<b>Joplin</b>	
Freeman Health System	115
St. John's Regional Medical Center	314
<b>Springfield</b>	
Lester E. Cox Medical Center South	247
St. John's Regional Health Center	210
<b>Rest of Area</b>	
Freeman Neosho Hospital	1
McCune-Brooks Hospital	5
Skaggs Community Health Center	1
<b>St Louis / Eastern Region</b>	
<b>Farmington</b>	
Mineral Area Regional Medical Center	1
Parkland Health Center	15
<b>St. Charles County</b>	
Barnes-Jewish St. Peter's Hospital	8
Crossroads Regional Hospital	1
SSM St. Joseph Health Center	77
St. Joseph Hospital West	4

Region	Average
Subregion	Annual
Hospital	Volume
<b>St. Louis City / County</b>	
Barnes-Jewish Hospital	250
Christian Hospital Northeast-Northwest	83
Depaul Health Center	56
Des Peres Hospital	45
Forest Park Hospital	31
Missouri Baptist Medical Center	185
Saint Louis University Hospital	38
Southpointe Hospital	6
SSM St. Joseph Hospital of Kirkwood	49
SSM St. Mary's Health Center	81
St. Alexius Brothers' Hospital	14
St. Anthony's Medical Center	161
St. John's Mercy Medical Center	104
St. Luke's Hospital	81
<b>Rest of Area</b>	
Jefferson Memorial Hospital	29
Lincoln County Memorial Hospital	2
St. John's Mercy Hospital Washington	55

## Procedure-Specific Questions

- ◆ Is my procedure serious enough that I need to have a carotid endarterectomy?
- ◆ Is there a chance that I could still have a stroke after the operation is completed?
- ◆ After the procedure, will I have to be on medication? If yes, how long will I have to take this medication and what are the side effects of these medications?

(See page 3 for other questions)

# Coronary Artery Bypass Graft

Coronary artery bypass surgery, also referred to by its initials as “CABG,” is a common surgical procedure used to correct severe blockages of arteries in the heart (coronary artery disease). In coronary artery disease, the blood vessels that nourish the heart muscle become narrowed or completely blocked, causing the amount of blood flow through them to decrease. The purpose of coronary artery bypass graft surgery is to improve the blood supply to an area of the heart that has been deprived of adequate circulation. Veins from other parts of the body are grafted onto the diseased coronary artery above and below the blockage. This graft restores blood circulation to the damaged area.

Coronary artery bypass surgery is actually two surgeries performed at the same time. One incision is made in the leg to remove a vein. This vein is used as a graft, or conduit, to create a new coronary artery. Another incision is made in the chest to allow the surgeon to reach the heart. The length and number of incisions depend on how many bypasses are needed.

One end of the vein graft is sewn in the side of the aorta, the large artery of the heart. The other end of the graft is sewn below the area of the blocked coronary artery. This vein actually detours, or “bypasses,” the blood around the obstruction to restore good blood flow to the area. The graft is usually taken from the saphenous vein in the leg, an internal mammary vein or a radial artery. The two veins are typically used because they are long enough. Since the legs and arms have numerous other blood vessels, these veins are not missed and circulation is still good after surgery. Coronary artery bypass surgery generally takes from 3 to 6 hours, depending on how many bypasses are needed.

Studies indicate that a hospital that performs more than 100 CABG surgeries per year may provide better quality of care. According to the American College of Cardiology / American Heart Association Task Force Subcommittee on Coronary Artery Bypass Graft Surgery, a recommended yearly minimum of 200 to 300 operations should be performed by hospitals caring for patients with heart disease, and 100 to 150 minimum per surgeon; Health Canada recommends 150, and a London, England independent report recommends a workload of 200 to 250.

[See page 20 for references, numbers 1, 5, 7, 35 and 39.]

Region	Subregion	Average Annual Volume
	Hospital	
<b>Central / Northeastern Region</b>		
<b>Columbia</b>		
	Boone Hospital Center	378
	Columbia Regional Hospital	5
	University Hospitals and Clinics	352
<b>Jefferson City</b>		
	Capital Region Medical Center	155
	St. Mary's Health Center	213
<b>Rest of Area</b>		
	Lake Regional Health System	82
<b>Kansas City / Western Region</b>		
<b>Clay / Platte Counties</b>		
	North Kansas City Hospital	228
<b>Eastern Jackson County</b>		
	Independence Regional Health Center	151
<b>Kansas City (Jackson County)</b>		
	Baptist Medical Center	108
	Research Medical Center	300
	Saint Joseph Health Center	220
	Saint Luke's Hospital	779
<b>Rest of Area</b>		
	Heartland Regional Medical Center	228
<b>Southeastern Region</b>		
<b>Cape Girardeau</b>		
	Saint Francis Medical Center	274
	Southeast Missouri Hospital	360



Region	Average
Subregion	Annual
Hospital	Volume
<b>Southwestern Region</b>	
<b>Joplin</b>	
Freeman Health System	290
St. John's Regional Medical Center Joplin	396
<b>Springfield</b>	
Lester E. Cox Medical Center South	483
St. John's Regional Health Center	856
<b>St Louis / Eastern Region</b>	
<b>St. Charles County</b>	
SSM St. Joseph Health Center	225
<b>St. Louis City / County</b>	
Barnes-Jewish Hospital	621
Christian Hospital Northeast-Northwest	521
Depaul Health Center	246
Des Peres Hospital	142
Forest Park Hospital	99
Missouri Baptist Medical Center	658
Saint Louis University Hospital	225
SSM St. Joseph Hospital of Kirkwood	147
SSM St. Mary's Health Center	215
St. Anthony's Medical Center	493
St. John's Mercy Medical Center	533
St. Luke's Hospital	509
<b>Rest of Area</b>	
Jefferson Memorial Hospital	69



### Procedure-Specific Questions

- ◆ What are the risks involved with having a Coronary Artery Bypass Graft?
- ◆ Will I have to change my physical activity after my surgery?
- ◆ Will it be okay to engage in sexual intercourse after my surgery?

(See page 3 for other questions)

# Heart Transplant

Heart transplants are the third most common transplant operations in the United States. There are over 1,500 cases per year. A healthy heart is obtained from a donor who has suffered brain death but remains on life-support. The healthy heart is then transported in a special solution that preserves the organ.

While the patient is deep asleep and pain-free (general anesthesia), an incision is made through the breastbone (sternum). The patient's blood is re-routed through tubes to a heart-lung bypass machine to keep the blood oxygen-rich and circulating. The patient's diseased heart is removed and the donor heart is stitched in place.

A heart transplant may be recommended for heart failure caused by:

- Coronary artery disease
- Cardiomyopathy (thickening of the heart walls)
- Heart valve disease with congestive heart failure
- Severe congenital heart disease

Heart transplant surgery is not recommended for patients who have:

- Kidney, lung, or liver disease
- Insulin-dependent diabetes mellitus (IDDM)
- Other life-threatening diseases

Research suggests that hospitals that perform 9 or more heart transplants per year have better patient outcomes than those who do not perform these amounts. However, Medicare requires that hospitals perform 12 or more heart transplants per year for reimbursement. In addition, the National Task Force on Organ Transplantation has established the volume threshold for heart transplants as 12 or more per year.

[See page 20 for references, numbers 7, 9 and 17.]

Region	Average Annual Volume
Subregion	
Hospital	
<b>Central / Northeastern Region</b>	
<b>Columbia</b>	
University Hospitals and Clinics	10
<b>Kansas City / Western Region</b>	
<b>Kansas City (Jackson County)</b>	
Saint Luke's Hospital	18
<b>St Louis / Eastern Region</b>	
<b>St. Louis City / County</b>	
Barnes-Jewish Hospital	16
Saint Louis University Hospital	14

## Procedure-Specific Questions

- ◆ Who can get a new heart?
- ◆ How does a donor heart get to me?
- ◆ How will I know when a donor heart is ready for me?
- ◆ What happens just before, during and after my heart surgery?
- ◆ What will I go through before I can go home with my new heart?

(See page 3 for other questions)

# Pediatric Cardiac Surgery

Pediatric cardiac surgery is performed on infants and children who have congenital (existing at the time of birth) heart defects. There are many types of congenital heart defects and not all of them require surgery. However, there are some that are quite severe causing your child to have the following symptoms: growth retardation, decreased exercise tolerance, increase in the size of the heart muscle, cyanosis (blue color observed in the skin and mucous membranes), shortness of breath and difficulty breathing, and increased heart rate.

Research studies suggest that hospitals that perform more than 100 pediatric cardiac surgeries per year have better outcomes than hospitals and surgeons that perform fewer than 100 cases per year. For surgeons, it is suggested that they perform a minimum of 75 or more pediatric cardiac surgeries per year. For all cardiac surgery the Cardiac Care Network of Ontario (CCN) Consensus Panel on Cardiac Surgical Services recommends an annual minimum of 150 procedures per surgeon and 500 per center.

[See page 20 for references, numbers 1, 2, 7 and 16.]

Region	Average Annual Volume
Subregion	
Hospital	
<b>Central / Northeastern Region</b>	
<b>Columbia</b>	
University Hospitals and Clinics	17
<b>Kansas City / Western Region</b>	
<b>Kansas City (Jackson County)</b>	
Children's Mercy Hospital	230
Saint Luke's Hospital	1
<b>St Louis / Eastern Region</b>	
<b>St. Louis City / County</b>	
Christian Hospital Northeast-Northwest	1
Saint Louis University Hospital	1
SSM Cardinal Glennon Children's Hospital	101
St. Louis Children's Hospital	291

## Procedure-Specific Questions

- ◆ Are there any other options besides surgery to treat my child's congenital heart defect?
- ◆ How long can we wait before the surgery needs to be done?
- ◆ What should I do to prepare my child for this type of surgery?
- ◆ Will I be allowed to stay with my child in the hospital?
- ◆ Will my child have to have other operations after this one in order to continue repair of the congenital heart defect?

(See page 3 for other questions)



# Percutaneous Transluminal Coronary Angioplasty (PTCA or Coronary Angioplasty)

Fatty deposits (plaques) that have accumulated on the inside of the coronary arteries can narrow these passages considerably, causing blood flow to the heart to be dangerously reduced. Providing adequate circulation to the heart muscle is important to prevent a heart attack. Percutaneous transluminal coronary angioplasty (PTCA) can improve the blood supply. They are performed on people who have chest pain (angina) and sometimes on those who have had a heart attack.

PTCA is done during cardiac catheterization. A thin, plastic tube, called a catheter, is inserted into a blood vessel in either the right groin or the right arm. Once it is positioned into the coronary artery near the narrowed portion, a smaller catheter with a deflated balloon at its tip is threaded through the cardiac catheter. When the balloon catheter reaches the narrowed portion, the balloon is inflated to flatten the fatty deposit against the artery wall. In other instances, the balloon is used to deliver a “stent” for this same purpose. The balloon is inflated, the stent expands and then remains in the artery after the balloon is removed.

The procedure is monitored on an x-ray screen that magnifies the images so the doctor can observe when the artery is open sufficiently. Once the artery is opened and blood is flowing more freely through the vessel, the balloon catheter is removed.

Research studies, as well as recommendations of the American College of Cardiology and the American Heart Association, indicate that a hospital perform a minimum of 200 PTCAs per year and that surgeons perform 125 during the training period and a minimum of 75 PTCAs per year. However, some research studies have suggested that hospitals that perform 400 or more procedures per year have better outcomes than hospitals who perform fewer than 400 cases per year. It is important to note that a recent study indicates that while “the American College of Cardiology/American Heart Association guidelines have minimum volume standards that remain at 200 procedures annually... even lower minimum volume standards may be justifiable in less populated areas, where the alternative is no access to angioplasty at all.”

Region	Subregion Hospital	Average Annual Volume
<b>Central / Northeastern Region</b>		
<b>Columbia</b>		
	Boone Hospital Center	1005
	Columbia Regional Hospital	6
	University Hospitals and Clinics	444
<b>Jefferson City</b>		
	Capital Region Medical Center	217
	St. Mary's Health Center	399
<b>Rest of Area</b>		
	Audrain Medical Center	4
	Bothwell Regional Health Center	1
	Lake Regional Health System	192
<b>Kansas City / Western Region</b>		
<b>Clay / Platte Counties</b>		
	North Kansas City Hospital	675
<b>Eastern Jackson County</b>		
	Independence Regional Health Center	239
	Medical Center of Independence	39
<b>Kansas City (Jackson County)</b>		
	Baptist Medical Center	252
	Research Medical Center	503
	Saint Joseph Health Center	573
	Saint Luke's Hospital	1681
<b>Rest of Area</b>		
	Heartland Regional Medical Center	458

[See page 20 for references, numbers 4, 7, 10, 15, 18, 20, 22, 23, 29, 30, 31 and 34.]

Region	Average
Subregion	Annual
Hospital	Volume
<b>Southeastern Region</b>	
<b>Cape Girardeau</b>	
Saint Francis Medical Center	225
Southeast Missouri Hospital	395
<b>Southwestern Region</b>	
<b>Joplin</b>	
Freeman Health System	593
St. John's Regional Medical Center	843
<b>Springfield</b>	
Lester E. Cox Medical Center North	1
Lester E. Cox Medical Center South	891
St. John's Regional Health Center	1539
<b>Rest of Area</b>	
Skaggs Community Health Center	89
<b>St Louis / Eastern Region</b>	
<b>St. Charles County</b>	
SSM St. Joseph Health Center	251
<b>St. Louis City / County</b>	
Barnes-Jewish Hospital	1216
Christian Hospital Northeast-Northwest	746
Depaul Health Center	292
Des Peres Hospital	245
Forest Park Hospital	186
Missouri Baptist Medical Center	1027
Saint Louis University Hospital	222
SSM St. Joseph Hospital of Kirkwood	214
SSM St. Mary's Health Center	520
St. Anthony's Medical Center	1126
St. John's Mercy Medical Center	494
St. Luke's Hospital	524
<b>Rest of Area</b>	
Jefferson Memorial Hospital	136



### Procedure-Specific Questions

- ◆ How do I know if I am a candidate for PTCA?
- ◆ How safe is PTCA compared to other methods of opening up my coronary artery?
- ◆ How effective is PTCA? Will it ever have to be repeated at some point?

(See page 3 for other questions)



# Abdominal Aortic Aneurysm Repair

An aneurysm is an enlargement or bulging of an artery. All artery walls are made of three layers. There are outer, middle, and inner layers. The enlargement or bulging occurs at a weak area of the middle layer of an artery wall. An aneurysm occurs anywhere along the length of the aorta (the large blood vessel that carries blood away from the heart to all parts of the body). This aneurysm can be located in either the chest or the abdomen (stomach area). However, it occurs four times more frequently in the abdomen.

Aortic aneurysms most frequently occur in white men between 50 and 60 years of age. But women are also at risk for developing abdominal aortic aneurysm. The most common cause of an aortic aneurysm is partial clogging of the aorta. Other factors that can increase the chances of having an aortic aneurysm include high blood pressure, smoking, and a family history of aortic aneurysm.

The goal of medical management is to prevent rupture (bursting) of the aneurysm. The only effective treatment of an abdominal aortic aneurysm is surgery (abdominal aortic aneurysm repair). During this surgery, the area where the aneurysm is located is clamped off, cut out, and a patch or artificial piece of blood vessel is sewn where the aneurysm was.

**Research studies indicate that better outcomes are achieved when the number of elective abdominal aortic aneurysm repair procedures performed per year at a hospital is in the range of 27 or more.**

[See page 20 for references, numbers 6, 7, 13, 21, 26, 27, 28 and 32.]

Region	Subregion	Average Annual Volume
Hospital		
<b>Central / Northeastern Region</b>		
<b>Columbia</b>		
	Boone Hospital Center	44
	Columbia Regional Hospital	1
	University Hospitals and Clinics	16
<b>Jefferson City</b>		
	Capital Region Medical Center	4
	St. Mary's Health Center	16
<b>Rest of Area</b>		
	Bothwell Regional Health Center	1
	Hannibal Regional Hospital	2
	Lake Regional Health System	6
	Northeast Regional Medical Center	1
<b>Kansas City / Western Region</b>		
<b>Clay / Platte Counties</b>		
	Liberty Hospital	9
	North Kansas City Hospital	24
<b>Eastern Jackson County</b>		
	Independence Regional Health Center	9
	Lees Summit Hospital	2
	Medical Center of Independence	2
	St. Mary's Hospital of Blue Springs	1
<b>Kansas City (Jackson County)</b>		
	Baptist Medical Center	12
	Research Medical Center	29
	Saint Joseph Health Center	17
	Saint Luke's Hospital	61
	Truman Medical Center-Hospital Hill	1
<b>Rest of Area</b>		
	Heartland Regional Medical Center	25

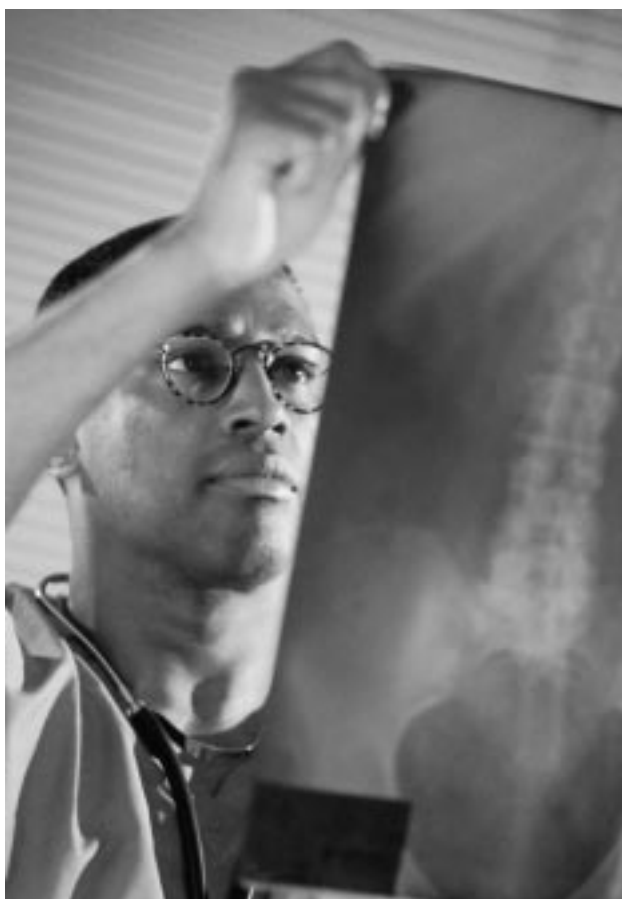
## Procedure-Specific Questions

- ◆ What will happen to me if I do not have my abdominal aortic aneurysm repaired?
- ◆ What is the likelihood that my aneurysm will rupture (burst) if I do not have surgery?
- ◆ If I am very athletic, will I have to reduce my activity level?

(See page 3 for other questions)

Region	Average
Subregion	Annual
Hospital	Volume
<b>Southeastern Region</b>	
<b>Cape Girardeau</b>	
Saint Francis Medical Center	22
Setheast Missouri Hospital	12
<b>Poplar Bluff</b>	
Three Rivers Healthcare	1
<b>Rest of Area</b>	
Missouri Delta Medical Center	2
<b>Southwestern Region</b>	
<b>Joplin</b>	
Freeman Health System	21
St. John's Regional Medical Center	50
<b>Springfield</b>	
Lester E. Cox Medical Center South	43
St. John's Regional Health Center	43
<b>Rest of Area</b>	
Skaggs Community Health Center	1

Region	Average
Subregion	Annual
Hospital	Volume
<b>St Louis / Eastern Region</b>	
<b>Farmington</b>	
Parkland Health Center	3
<b>St. Charles County</b>	
Barnes-Jewish St Peters Hospital	3
SSM St. Joseph Health Center	16
<b>St. Louis City / County</b>	
Barnes-Jewish Hospital	85
Christian Hospital Northeast-Northwest	20
Depaul Health Center	16
Des Peres Hospital	9
Forest Park Hospital	5
Missouri Baptist Medical Center	69
Saint Louis University Hospital	17
Southpointe Hospital	1
SSM St. Joseph Hospital of Kirkwood	10
SSM St. Mary's Health Center	15
St. Alexius Hospital	4
St. Anthony's Medical Center	27
St. John's Mercy Medical Center Creve Coeur	33
St. Luke's Hospital	17
<b>Rest of Area</b>	
Jefferson Memorial Hospital	6
St. John's Mercy Hospital Washington	1



# Lower Extremity Arterial By-Pass

A lower extremity arterial by-pass graft is a surgical procedure used to correct arteriosclerosis of the extremities (legs and feet). Since it is a hardening of the arteries, arteriosclerosis results in decreased blood flow to these areas resulting in pain, especially when walking, numbness, tingling, and weakness. In some severe cases, patients develop an ulcer, or sore, on the leg or foot that doesn't heal. Factors that contribute to this disease include smoking, high blood pressure, diabetes, high cholesterol, a family history of heart or vascular disease, or being overweight.

Lower extremity arterial by-pass grafts are performed only on severe cases where the ability to work or pursue essential activities is affected. In this procedure, a vein graft from another part of the body or a graft made from artificial material is used to create a detour around the blocked artery.

**Research studies indicate that low volume hospitals are those that perform fewer than 20 lower extremity arterial by-pass grafts per year.**

[See page 20 for references, number 7.]

## Procedure-Specific Questions

- ◆ From what part of my body will the vein graft be taken?
- ◆ If you cannot take a vein graft from my body, what kind of material will you use to make one? How will my body respond to this artificial material?
- ◆ What will my recovery be like?
- ◆ Is there a chance that my arteries will harden again?
- ◆ Will I be able to exercise vigorously after my surgery?
- ◆ Will my pain be alleviated after the surgery is completed?
- ◆ Will I be able to resume my normal daily activities after my surgery?

(See page 3 for other questions)

Region	Subregion	Average Annual Volume
Hospital		
<b>Central / Northeastern Region</b>		
<b>Columbia</b>		
	Boone Hospital Center	116
	Columbia Regional Hospital	4
	University Hospitals and Clinics	80
<b>Jefferson City</b>		
	Capital Region Medical Center	22
	St. Mary's Health Center	37
<b>Rest of Area</b>		
	Audrain Medical Center	5
	Bothwell Regional Health Center	14
	Fitzgibbon Hospital	2
	Hannibal Regional Hospital	14
	Lake Regional Health System	27
	Northeast Regional Medical Center	19
<b>Kansas City / Western Region</b>		
<b>Clay / Platte Counties</b>		
	Liberty Hospital	41
	North Kansas City Hospital	93
	St. Luke's Northland Hospital	5
<b>Eastern Jackson County</b>		
	Independence Regional Health Center	29
	Lees Summit Hospital	7
	Medical Center of Independence	17
	St. Mary's Hospital of Blue Springs	6
<b>Kansas City (Jackson County)</b>		
	Baptist Medical Center	60
	Research Medical Center	142
	Saint Joseph Health Center	53
	Saint Luke's Hospital	101
	Truman Medical Center-Hospital Hill	43
<b>Rest of Area</b>		
	Cameron Community Hospital	4
	Heartland Regional Medical Center	49

Region	Average
Subregion	Annual
Hospital	Volume
<b>Southeastern Region</b>	
<b>Cape Girardeau</b>	
Saint Francis Medical Center	109
Southeast Missouri Hospital	49
<b>Farmington</b>	
Mineral Area Regional Medical Center	3
Parkland Health Center	15
<b>Poplar Bluff</b>	
Three Rivers Healthcare	1
<b>Rest of Area</b>	
Missouri Delta Medical Center	19
<b>Southwestern Region</b>	
<b>Joplin</b>	
Freeman Health System	62
St. John's Regional Medical Center	170
<b>Springfield</b>	
Lester E. Cox Medical Center South	145
St. John's Regional Health Center	85
<b>Rest of Area</b>	
Freeman Neosho Hospital	2
Skaggs Community Health Center	4

Region	Average
Subregion	Annual
Hospital	Volume
<b>St Louis / Eastern Region</b>	
<b>St. Charles County</b>	
Barnes-Jewish St. Peter's Hospital	13
Crossroads Regional Hospital	6
SSM St. Joseph Health Center	79
SSM St. Joseph Hospital West	1
<b>St. Louis City / County</b>	
Barnes-Jewish Hospital	328
Christian Hospital Northeast-Northwest	106
Depaul Health Center	51
Des Peres Hospital	21
Forest Park Hospital	51
Missouri Baptist Medical Center	179
Saint Louis University Hospital	56
Southpointe Hospital	8
SSM St. Joseph Hospital of Kirkwood	47
SSM St. Mary's Health Center	76
St. Alexius Hospital	14
St. Anthony's Medical Center	142
St. John's Mercy Medical Center	160
St. Luke's Hospital	72
<b>Rest of Area</b>	
Jefferson Memorial Hospital	19
Lincoln County Memorial Hospital	1
St. John's Mercy Hospital Washington	15



# Cerebral Aneurysm Repair

Cerebral aneurysm is the fourth most frequent cerebrovascular disorder. A cerebral aneurysm is an aneurysm of the brain and it occurs when there is a weakened area in the wall of a blood vessel that causes dilatation (widening). People with cerebral aneurysms can be born with one or develop it later in life. It is estimated that 5% of the population has some type of aneurysm.

Symptoms usually do not appear until complications develop. Bleeding is the most common cause of symptoms. Weakness, numbness, or other loss of nerve function may occur because of pressure from the aneurysm on adjacent brain tissue or because of reduced blood flow caused by a spasm of other blood vessels near a ruptured (burst) aneurysm.

Because symptoms often do not appear until bleeding occurs, cerebral aneurysm may be an emergency condition when it is discovered. The goal of treatment is to control symptoms and prevent further bleeding. Surgery, cerebral aneurysm repair, is the primary treatment for cerebral aneurysm. In order to repair the aneurysm, the doctor will have to perform a craniotomy (cut through the skull). The base of the aneurysm is closed off to prevent blood flow through the aneurysm. Several techniques are available to accomplish this. Clipping involves placing a clip on the neck of the aneurysm. Wrapping involves reinforcement of the weakened arterial wall. Ligation of the neck of the aneurysm involves binding.

**Research suggests that a low volume hospital is one that performed less than 30 cerebral aneurysm repairs per year.**

[See page 20 for references, numbers 7 and 37.]

## Procedure-Specific Questions

- ◆ Is there a possibility that I may have seizures because of the craniotomy?
- ◆ Will my hair have to be shaved for the surgery?
- ◆ Will the craniotomy cause me to lose or decrease function of my hands and feet? Will it affect my speech?
- ◆ Will I be admitted to the intensive care unit after my surgery?

(See page 3 for other questions)

Region	Subregion	Average Annual Volume
	Hospital	
<b>Central / Northeastern Region</b>		
<b>Columbia</b>		
	Boone Hospital Center	17
	University Hospitals and Clinics	22
<b>Kansas City / Western Region</b>		
<b>Clay / Platte Counties</b>		
	North Kansas City Hospital	2
<b>Eastern Jackson County</b>		
	Independence Regional Health Center	3
<b>Kansas City (Jackson County)</b>		
	Baptist Medical Center	3
	Research Medical Center	17
	Saint Joseph Health Center	2
	Saint Luke's Hospital	16
	Truman Medical Center-Hospital Hill	1
<b>Rest of Area</b>		
	Heartland Regional Medical Center	1
<b>Southeastern Region</b>		
<b>Cape Girardeau</b>		
	Saint Francis Medical Center	15
	Southeast Missouri Hospital	3
<b>Southwestern Region</b>		
<b>Joplin</b>		
	Freeman Health System	6
	St. John's Regional Medical Center	4
<b>Springfield</b>		
	Lester E. Cox Medical Center South	17
	St. John's Regional Health Center	19
<b>St Louis / Eastern Region</b>		
<b>St. Charles County</b>		
	SSM St. Joseph Health Center	5
<b>St. Louis City / County</b>		
	Barnes-Jewish Hospital	68
	Christian Hospital Northeast-Northwest	16
	Depaul Health Center	6
	Forest Park Hospital	5
	Missouri Baptist Medical Center	2
	Saint Louis University Hospital	24
	SSM St. Joseph Hospital of Kirkwood	3
	SSM St. Mary's Health Center	7
	St. Anthony's Medical Center	11
	St. John's Mercy Medical Center	15
	St. Luke's Hospital	9



# Esophageal Cancer Surgery

Esophageal cancer usually occurs in individuals 50 years of age or older. It is more commonly found in men and approximately four times more common in African American males than in white males. The two most important risk factors for esophageal cancer are smoking and excessive alcohol intake.

The treatment for esophageal cancer depends on the location of the tumor and whether or not the cancer has spread to other parts of the body (metastasis). Surgical removal, esophageal cancer surgery, and radiation are the two methods used. The best results have been obtained by combining surgery and radiation. If the tumor is in the upper one-third of the esophagus (cervical), radiation will probably be used. However, surgery is usually performed if the tumor is in the lower one-third of the esophagus. This is known as surgically resecting the tumor.

Several types of surgical procedures that can be performed are: (1) removal of part or all of the esophagus (esophagectomy); (2) resection of a portion of the esophagus and connecting (anastomosis) the remaining portion of the stomach (esophagogastrostomy); and (3) resection of a portion of the esophagus and anastomosis of a segment of colon to the remaining portion (esophagoenterostomy). The surgical approaches may be done through the thorax (chest) or using both an abdominal and thoracic approach.

**Research suggests that physicians who perform 6 or more of these surgeries per year are considered high volume physicians. Physicians who perform 3 or less per year are considered low volume physicians. Most studies suggest that low hospital volume is less than 7 esophageal cancer surgeries per year. However, a recent study identified high volume hospitals as performing 20 or more procedures per year.**

[See page 20 for references, numbers 7, 19, 33, 40, and 41.]

Region	Average
Subregion	Annual
Hospital	Volume
<b>Central / Northeastern Region</b>	
<b>Columbia</b>	
Boone Hospital Center	1
University Hospitals and Clinics	4
<b>Kansas City / Western Region</b>	
<b>Kansas City (Jackson County)</b>	
Research Medical Center	1
Saint Luke's Hospital	1
Truman Medical Center-Hospital Hill	1
<b>Rest of Area</b>	
Heartland Regional Medical Center	1
<b>Southeastern Region</b>	
<b>Cape Girardeau</b>	
Saint Francis Medical Center	2
<b>Southwestern Region</b>	
<b>Joplin</b>	
Freeman Health System	1
St. John's Regional Medical Center	1
<b>St Louis / Eastern Region</b>	
<b>St. Louis City / County</b>	
Barnes-Jewish Hospital	11
Christian Hospital Northeast-Northwest	1
Saint Louis University Hospital	3
SSM St. Joseph Hospital of Kirkwood	1
St. Alexius Hospital	1

## Procedure-Specific Questions

- ◆ Will I receive radiation treatment and/or chemotherapy in addition to my surgery?
- ◆ If I need radiation treatments and/or chemotherapy, what are their side effects?
- ◆ Will this surgery impair my speech (make speaking difficult for me)?
- ◆ Will this surgery make it difficult for me to breathe?
- ◆ How will I be able to eat? Will a feeding tube be placed into my stomach?
- ◆ If I need a feeding tube, who will take care of it?
- ◆ What will I be able to eat?
- ◆ Will I only be able to eat at special times?

(See page 3 for other questions)

# Pancreatic Cancer Surgery

The incidence of pancreatic cancer is increasing, currently the fourth leading cause of death from cancer. It is more common in men over 50 years of age and slightly more common in African American and Jewish people. The cause of cancer of the pancreas remains unknown. However, cigarette smoking (10 to 15 per day) is now firmly established as a significant risk factor in the development of cancer of the pancreas.

The most effective treatment of cancer of the pancreas is surgery. Pancreatic cancer surgery, pancreatic resection, and Whipple's procedure are all surgeries to remove cancer from the pancreas. The most common surgery is Whipple's procedure which involves surgery on portions of the pancreas and stomach, the duodenum, gallbladder, and common bile duct. The pancreatic duct is then connected to the jejunum (an area of the small intestines).

A total pancreatectomy may be required for curing cancer that involves the head of the pancreas. The entire pancreas and the spleen are removed along with regional lymph nodes.

Today it is recognized that the pancreas and its adjacent organs can be removed. However, this is a complicated procedure that produces lifelong side effects involving the endocrine system and can result in significant postoperative complications. Therefore, pancreatic resection is limited to life-threatening conditions such as cancer or severe trauma.

**Research suggests that hospitals that perform 5 or more pancreatic cancer surgeries per year have better outcomes than hospitals and surgeons that perform fewer than 5 cases per year.**

## Procedure-Specific Questions

- ◆ Are there any other options besides surgery to treat my pancreatic cancer?
- ◆ Which type of pancreatic cancer surgery will I need?
- ◆ What are the complications that can occur with pancreatic cancer surgery?
- ◆ What are the long-term complications?
- ◆ Will I need any other treatments, such as radiation or chemotherapy, when my surgery is completed?
- ◆ Will all of my cancer be gone after surgery?
- ◆ How long can I wait before the surgery needs to be done?

(See page 3 for other questions)

Region	Average Annual Volume
Subregion	
Hospital	
<b>Central / Northeastern Region</b>	
<b>Columbia</b>	
Boone Hospital Center	1
University Hospitals and Clinics	6
<b>Jefferson City</b>	
St. Mary's Health Center	1
<b>Kansas City / Western Region</b>	
<b>Eastern Jackson County</b>	
Independence Regional Health Center	2
Medical Center of Independence	1
<b>Kansas City (Jackson County)</b>	
Baptist Medical Center	2
Research Medical Center	4
Saint Joseph Health Center	2
Saint Luke's Hospital	8
Truman Medical Center-Hospital Hill	2
<b>Rest of Area</b>	
Heartland Regional Medical Center	4
Research Belton Hospital	1
<b>Southeastern Region</b>	
<b>Cape Girardeau</b>	
Southeast Missouri Hospital	1
<b>Southwestern Region</b>	
<b>Joplin</b>	
Freeman Health System	2
St. John's Regional Medical Center	3
<b>Springfield</b>	
Lester E. Cox Medical Centers South	4
St. John's Regional Health Center	1
<b>St Louis / Eastern Region</b>	
<b>St. Louis City / County</b>	
Barnes-Jewish Hospital	51
Christian Hospital Northeast-Northwest	3
Depaul Health Center	1
Missouri Baptist Medical Center	3
Saint Louis University Hospital	9
SSM St. Joseph Hospital of Kirkwood	1
SSM St. Mary's Health Center	2
St. Anthony's Medical Center	2
St. John's Mercy Medical Center	3
St. Luke's Hospital	4
<b>Rest of Area</b>	
Jefferson Memorial Hospital	1

[See page 20 for references, numbers 3, 7, 11, 12, 25, 36 and 38.]

# Table of Hospitals

Hospital	Region	Sub-Region
Audrain Medical Center	Central / Northeastern Region	Rest of Area
Baptist Medical Center	Kansas City / Western Region	Kansas City (Jackson County)
Barnes Jewish St. Peters Hospital	St Louis / Eastern Region	St. Charles County
Barnes-Jewish Hospital	St Louis / Eastern Region	St. Louis City / County
Boone Hospital Center	Central / Northeastern Region	Columbia
Bothwell Regional Health Center	Central / Northeastern Region	Rest of Area
Cameron Community Hospital	Kansas City / Western Region	Rest of Area
Capital Region Medical Center	Central / Northeastern Region	Jefferson City
Children's Mercy Hospital	Kansas City / Western Region	Kansas City (Jackson County)
Christian Hospital Northeast-Northwest	St Louis / Eastern Region	St. Louis City / County
Columbia Regional Hospital	Central / Northeastern Region	Columbia
Crossroads Regional Hospital	St Louis / Eastern Region	St. Charles County
Depaul Health Center	St Louis / Eastern Region	St. Louis City / County
Des Peres Hospital	St Louis / Eastern Region	St. Louis City / County
Fitzgibbon Hospital	Central / Northeastern Region	Rest of Area
Forest Park Hospital	St Louis / Eastern Region	St. Louis City / County
Freeman Health System	Southwestern Region	Joplin
Freeman Neosho Hospital	Southwestern Region	Rest of Area
Hannibal Regional Hospital	Central / Northeastern Region	Rest of Area
Heartland Regional Medical Center	Kansas City / Western Region	Rest of Area
Independence Regional Health Center	Kansas City / Western Region	Eastern Jackson County
Jefferson Memorial Hospital	St Louis / Eastern Region	Rest of Area
Lake Regional Health System	Central / Northeastern Region	Rest of Area
Lees Summit Hospital	Kansas City / Western Region	Eastern Jackson County
Lester E. Cox Medical Centers North	Southwestern Region	Springfield
Lester E. Cox Medical Centers South	Southwestern Region	Springfield
Liberty Hospital	Kansas City / Western Region	Clay / Platte Counties
Lincoln County Memorial Hospital	St Louis / Eastern Region	Rest of Area
McCune-Brooks Hospital	Southwestern Region	Rest of Area
Medical Center of Independence	Kansas City / Western Region	Eastern Jackson County
Mineral Area Regional Medical Center	St Louis / Eastern Region	Farmington
Missouri Baptist Medical Center	St Louis / Eastern Region	St. Louis City / County
Missouri Delta Medical Center	Southeastern Region	Rest of Area
North Kansas City Hospital	Kansas City / Western Region	Clay / Platte Counties
Northeast Regional Medical Center	Central / Northeastern Region	Rest of Area
Parkland Health Center	St Louis / Eastern Region	Farmington
Research Belton Hospital	Kansas City / Western Region	Rest of Area
Research Medical Center	Kansas City / Western Region	Kansas City (Jackson County)
Saint Francis Medical Center	Southeastern Region	Cape Girardeau
Saint Joseph Health Center	Kansas City / Western Region	Kansas City (Jackson County)
Saint Louis University Hospital	St Louis / Eastern Region	St. Louis City / County
Saint Luke's Hospital	Kansas City / Western Region	Kansas City (Jackson County)
Saint Luke's Northland Hospital	Kansas City / Western Region	Clay Platte Counties
Skaggs Community Health Center	Southwestern Region	Rest of Area
Southeast Missouri Hospital	Southeastern Region	Cape Girardeau
Southpointe Hospital	St Louis / Eastern Region	St. Louis City / County
SSM Cardinal Glennon Children's Hospital	St Louis / Eastern Region	St. Louis City / County
SSM St. Joseph Health Center	St Louis / Eastern Region	St. Charles County
SSM St. Joseph Hospital Of Kirkwood	St Louis / Eastern Region	St. Louis City / County
SSM St. Joseph Hospital West	St Louis / Eastern Region	St. Charles County
SSM St. Mary's Health Center	St Louis / Eastern Region	St. Louis City / County
St. Alexis Hospital	St Louis / Eastern Region	St. Louis City / County
St. Anthony's Medical Center	St Louis / Eastern Region	St. Louis City / County
St. John's Mercy Hospital Washington	St Louis / Eastern Region	Rest of Area
St. John's Mercy Medical Center	St Louis / Eastern Region	St. Louis City / County
St. John's Regional Health Center	Southwestern Region	Springfield
St. John's Regional Medical Center	Southwestern Region	Joplin
St. Louis Children's Hospital	St Louis / Eastern Region	St. Louis City / County
St. Luke's Hospital	St Louis / Eastern Region	St. Louis City / County
St. Mary's Health Center	Central / Northeastern Region	Jefferson City
St. Mary's Hospital of Blue Springs	Kansas City / Western Region	Eastern Jackson County
Three Rivers Healthcare	Southeastern Region	Poplar Bluff
Truman Medical Center-Hospital Hill	Kansas City / Western Region	Kansas City (Jackson County)
University Hospitals and Clinics	Central / Northeastern Region	Columbia

# Bibliography

- 1 Advisory Council for Cardiothoracic Surgery (1996). Guidelines for standards in cardiac surgery. Available at: [http://www.facs.org/fellows\\_info/guidelines/cardiac.html](http://www.facs.org/fellows_info/guidelines/cardiac.html).
- 2 American Academy of Pediatrics (1991). Guidelines for pediatric cardiology diagnostic and treatment centers (RE9210). *Pediatrics*, 87(4), 576-580.
- 3 Birkmeyer, J.D., Finlayson, S.R.G., Tosteson, A.N.A., Sharp, S.M., Warshaw, A.L., Diahwe, W.A. (1999). Effect of hospital volume on in-hospital mortality with pancreaticoduodenectomy. *Surgery*, 125(3), 250-256.
- 4 Canto, J.G., Every, N.R., Magid, D.J., Rogers, W.J., Malmgren, J.A., Frederick, P.D., et al. The volume of primary angioplasty procedures and survival after acute myocardial infarction. *New England Journal Medicine* 2000; 342(21):1573-1580.
- 5 Crawford, F.A., Anderson, R.P., Clark, R.E., Grover, F.L., Kouchoukos, N.T., Waldhausen, J.A., Wilcox, B.R., for the Ad Hoc Committee on Cardiac Surgery Credentialing of the Society of Thoracic Surgeons (1996). Volume requirements for cardiac surgery credentialing: A critical examination. *Annals of Thoracic Surgery*, 61, 12-16.
- 6 Dardik, A., Lin, J.W., Gordon, T.A., Williams, G.M., Perler, B.A., Results of elective abdominal aortic aneurysm repair in the 1990s: A population-based analysis of 2335 cases. *Journal of Vascular Surgery* 1999; 30(6):985-995
- 7 Dudley, R.A., Johansen, K.L., Brand, R., Rennie, D.J., Milstein, A. (2000). Selective referral to high-volume hospitals: Estimating potentially avoidable deaths. *JAMA*, 283 (9), 159-166.
- 8 Edwards, W.H., Morris, J.A., Jenkins, J.M., Bass, S.M., MacKenzie, E.J. (1991). Evaluating quality, cost-effective health care: Vascular database predicated on hospital discharge abstracts. *Annals of Surgery*, 213 (5), 433-439.
- 9 Evans, R.W. (1992). Public and private insurer designation of transplantation programs. *Transplantation*, 53 (5), 1041-1046.
- 10 Every, N.R., Maynard, C., Schulman, K., Ritchie, J.L. The association between institutional primary angioplasty procedure volume and outcome in elderly Americans. *Journal of Invasive Cardiology* 2000; 12(6):303-308.
- 11 Gordon, T.A., Bowman, H.M., Bass, E.B., Lillemoe, K.D., Yeo, C.J., Heitmiller, R.F., et al. Complex gastrointestinal surgery: impact of provider experience on clinical and economic outcomes. *Journal of the American College of Surgeons* 1999; 189(1):46-56.
- 12 Gouma, D.J., van Greenen, R.C., van Gulik, T.M., de Haan, R.J., de Wit, L.T., Busch, O.R., et al. Rates of complications and death after pancreaticoduodenectomy: risk factors and the impact of hospital volume. *Annals of Surgery* 2000; 232(6):786-795.
- 13 Hannan, E.L., Kilburn, H., Jr., O'Donnell, J.F., Bernard, H.R., Shields, E.P., Lindsey, M.L., et al. A longitudinal analysis of the relationship between in-hospital mortality in New York State and the volume of abdominal aortic aneurysm surgeries performed. *Health Serv Res* 1992; 27(4): 517-542.
- 14 Hannan, E.L., Popp, J., Tranmer, B., Fuestel, P., Waldman, J., Shah, D. (1998). Relationship between provider volume and mortality for carotid endarterectomies in New York State. *Stroke*, 29, 2292-2297.
- 15 Hannan, E.L., Racz, M., Ryan, T.J., McCallister, B.D., Johnson, L.W., Arani, D.T., Guerci, A.D., Sosa, J., & Topol, E.J. (1997). Coronary angioplasty volume-outcome relationships for hospitals and cardiologists. *JAMA*, 277(11), 892-898.
- 16 Hannan, E.L., Racz, M., Kavey, R., Quaegebeur, J.M., Williams, R. (1998). Pediatric cardiac surgery: The effect of hospital and surgeon volume on in-hospital mortality. *Pediatrics*, 101(6), 963-969.
- 17 Hosenpud, J.D., Breen, T.J., Edwards, E.B., Daily, O.P., Hunsicker, L.G. (1994). The effect of transplant center volume on cardiac transplantation outcome: A report of the United Network for Organ Sharing Scientific Registry. *JAMA*, 271 (23), 1844-1849.
- 18 Ho V. Evolution of the volume-outcome relation for hospitals performing coronary angioplasty. *Circulation* 2000; 101(15):1806-1811.
- 19 Jarhult, J. (1996). The importance of volume for outcome in cancer surgery – an overview. *European Journal of Surgical Oncology*, 22, 205-215.
- 20 Jollis, J.G., Peterson, E.D., Nelson, C.L., Stafford, J.A., DeLong, E.R., Muhlbaier, L.H., Mark, D.B. (1997). Relationship between physician and hospital coronary angioplasty volume and outcome in elderly patients. *Circulation*, 95(11), 2485-2491.
- 21 Kazmers, A., Jacobs, L., Perkins, A., Lindenauer, S.M., Bates, E. (1996). Abdominal aortic aneurysm repair in Veterans Affairs medical centers. *Journal of Vascular Surgery*, 23 (2), 191-200.
- 22 Klein, L.W., Schaer, G.L., Calvin, J.E., Palvas, B., Allen, J., Loew, J., Uretz, E., Parrillo, J.E. (1997). Does low individual operator coronary interventional procedural volume correlate with worse institutional procedural outcome? *Journal of American College of Cardiologists*, 30 (4), 870-877.

- 23 Kimmel S., Berlin, J., Laskey, W., (1995) The relationship between coronary angioplasty procedure volume and major complications. *JAMA* 274: 1137-1142.
- 24 Kucey, D.S., Bowyer, B., Iron, K., Austin, P., Anderson, G., Tu, J.V. (1998). Determinants of outcome after carotid endarterectomy. *Journal of Vascular Surgery*, 28 (6), 1051-1058.
- 25 Lieberman, M.D., Kilburn, H., Lindsey, M., Brennan, M.F. Relation of perioperative deaths to hospital volume among patients undergoing pancreatic resection for malignancy. *Annals of Surgery* 1995; 222(5):638-645.
- 26 Luft, H.S., Bunker, J.P., Enthoven, A.C. (1979). Should operations be regionalized? The empirical relation between surgical volume and mortality. *The New England Journal of Medicine*, 301 (25), 1364-1369.
- 27 Luft, H.S., Hunt, S.S., Maerki, S.C. (1987). The volume-outcome relationship: Practice-makes-perfect or selective-referral patterns? *Health Services Research*, 22 (2), 157-182.
- 28 Maerki, S.C., Luft, H.S., Hunt, S.S. (1986). Selecting categories of patients for regionalization. *Medical Care*, 24 (2), 148-158.
- 29 Magid, D.J., Calonge, B.N., Rumsfeld, J.S., Canto, J.G., Frederick, P.D., Every, N.R., et al. Relation between hospital primary angioplasty volume and mortality for patients with acute MI treated with primary angioplasty vs thrombolytic therapy. *JAMA* 2000; 284(24):3131-3138.
- 30 Maynard, C., Every, N.R., Chapko, M.K., Ritchie, J.L. Outcomes of coronary angioplasty procedures performed in rural hospitals. [see comments]. *Am J Med* 2000; 108(9):710-713.
- 31 Maynard, C., Every, N.R., Chapko, M.K., Ritchie, J.L. Institutional volumes and coronary angioplasty outcomes before and after the introduction of stenting. *Effective Clinical Practice* 1999; 2(3):108-113.
- 32 McGrath, P.D., Wennberg, D.E., Dickens, J.D., Siewers, A.E., Lucas, F.L., Malenka, D.J., et al. Relation between operator and hospital volume and outcomes following percutaneous coronary interventions in the era of the coronary stent. *JAMA* 2000; 284(24):3139-3144
- 33 Patti, M.G., Corvera, C.U., Glasgow, R.E., Way, L.W. (1998). A hospital's annual rate of esophagectomy influences the operative mortality rate. *Journal of Gastrointestinal Surgery*, 2 (2), 186-192.
- 34 Ritchie, J.L., Maynard, C., Chapko, M.K., Every, N.R., Martin, D.C. (1999). Association between percutaneous transluminal coronary angioplasty volumes and outcomes in the healthcare cost and utilization project 1993-1994. *The American Journal of Cardiology*, 83, 493-497.
- 35 Showstack, J.A., Rosenfield, K.E., Garnick, D.W., Luft, H.S., Schaffarzick, R.W., Fowles, J. (1987) Association of volume with outcome of coronary artery bypass graft surgery: Scheduled vs nonscheduled operations. *JAMA*, 257 (6), 785-789.
- 36 Simunovic, M., To, T., Theriault, M., Langer, B. (1999). Relation between hospital surgical volume and outcome for pancreatic resection for neoplasm in a publicly funded health care system. *Canadian Medical Association Journal*, 160(5), 643-648.
- 37 Solomon, R.A., Mayer, S.A., Tarmey, J.J. (1996). Relationship between the volume of craniotomies for cerebral aneurysm performed at New York State hospitals and in-hospital mortality. *Stroke*, 27 (1), 13-17.
- 38 Sosa, J.A., Bowman, H.M., Gordon, T.A., Bass, E.B., Yeo, C.J., Lillemoe, K.D., et al. Importance of hospital volume in the overall management of pancreatic cancer. *Annals of Surgery* 1998; 228(3):429-438.
- 39 Sowden, A.J., Deeks, J.J., Sheldon, T.A. (1995). Volume and outcome in coronary artery bypass graft surgery: True association or artefact? *BMJ*, 311, 151-155.
- 40 Swisher, S.G., Deford, L., Merriman, K.W., Walsh, G.L., Smythe, R., Vaporicyan, A., et al. Effect of operative volume on morbidity, mortality, and hospital use after esophagectomy for cancer. *J Thorac Cardiovasc Surg* 2000; 119(6):1126-1132.
- 41 van Lanschot, J.J., Hulscher, J.B., Buskens, C.J., Tilanus, H.W., ten Kate, F.J., Obertop H. Hospital volume and hospital mortality for esophagectomy. *Cancer* 1915; 91(8):1574-1578.

#### IOM Citations

Hewitt M. (Institute of Medicine for the Committee on Quality of Health Care in America and the National Cancer Policy Board ). Interpreting the Volume-Outcome Relationship in the Context of Health Care Quality: Workshop Summary. 2000.

Hewitt M, Simone J. (Institute of Medicine and Commission on Life Sciences, National Research Council). Ensuring Quality Cancer Care. 1999.



# Show Me... 2002 Consumer's Guide to Hospital Surgery Volume

## Acknowledgements

### ADVISORY COMMITTEE

Mark A. Adams, MD, Medical Doctor, Columbia Orthopedic Group

Laura J. Champagne, Senior Consultant, UAW-Social Security Department

Tom Cranshaw, Senior Vice President of Strategic Planning, Health Midwest Hospital Systems

Mary Dunn, Executive Director, SE Missouri Area Business Group on Health

Daniel R. Longo, ScD, Professor & Director of Graduate Studies, Department of Family and Community Medicine, University of Missouri-Columbia

Becky Miller, Vice President, Quality and Regulatory Advocacy, Missouri Hospital Association

Laurie O'Connell, Manager, Insurance Benefits, Hallmark

David Ota, MD, Medical Director, Chief of Surgical Oncology, Ellis Fischel Hospital

Charles Porter, MD, FACC, Mid America Cardiology

Gary Rowe, President/CEO, St. John's Regional Medical Center

Robert Sutter, Director, Clinical Performance Measurement, BJC Health System

### MISSOURI DEPARTMENT OF HEALTH AND SENIOR SERVICES

Garland Land, Director, Center for Health Information Management & Evaluation

Susan Elder, Director, Section of Health Statistics

John H. Song, Bureau Chief, Health Care Performance Monitoring

Frank Schiffel, Research Analyst

Diann Six, Administrative Assistant

Theresa Cunningham, Clerk Typist III

### Department of Health and Senior Services would also like to thank the following for their assistance:

Linda Bade, Reimbursement Consultant Medical Records, University of Missouri-Columbia

Ann Barry Flood, PhD, Professor of Community & Family Medicine and Sociology, Director of Policy Studies at the Center for the Evaluative Clinical Sciences, Dartmouth Medical School

Edward L. Hannan, PhD, Professor and Chair, Dept. of Health Policy, Management and Behavior, University at Albany, School of Public Health

Maria Hewitt, Senior Program Officer, National Cancer Policy Board, Institute of Medicine

Gregg R. Laiben, MD, Medical Director, Missouri Patient Care Review Foundation

Lisa Lewis, RN, MA, Nurse Consultant

F. Sessions-Cole, MD, Director of Newborn Medicine, St. Louis Children's Hospital, Washington University School of Medicine

Rosalyn M. Steck, RHIT, CCS, Clinical Information Services Supervisor, Capital Region Medical Center

